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# FISHING INDUSTRY IN BRAZIL

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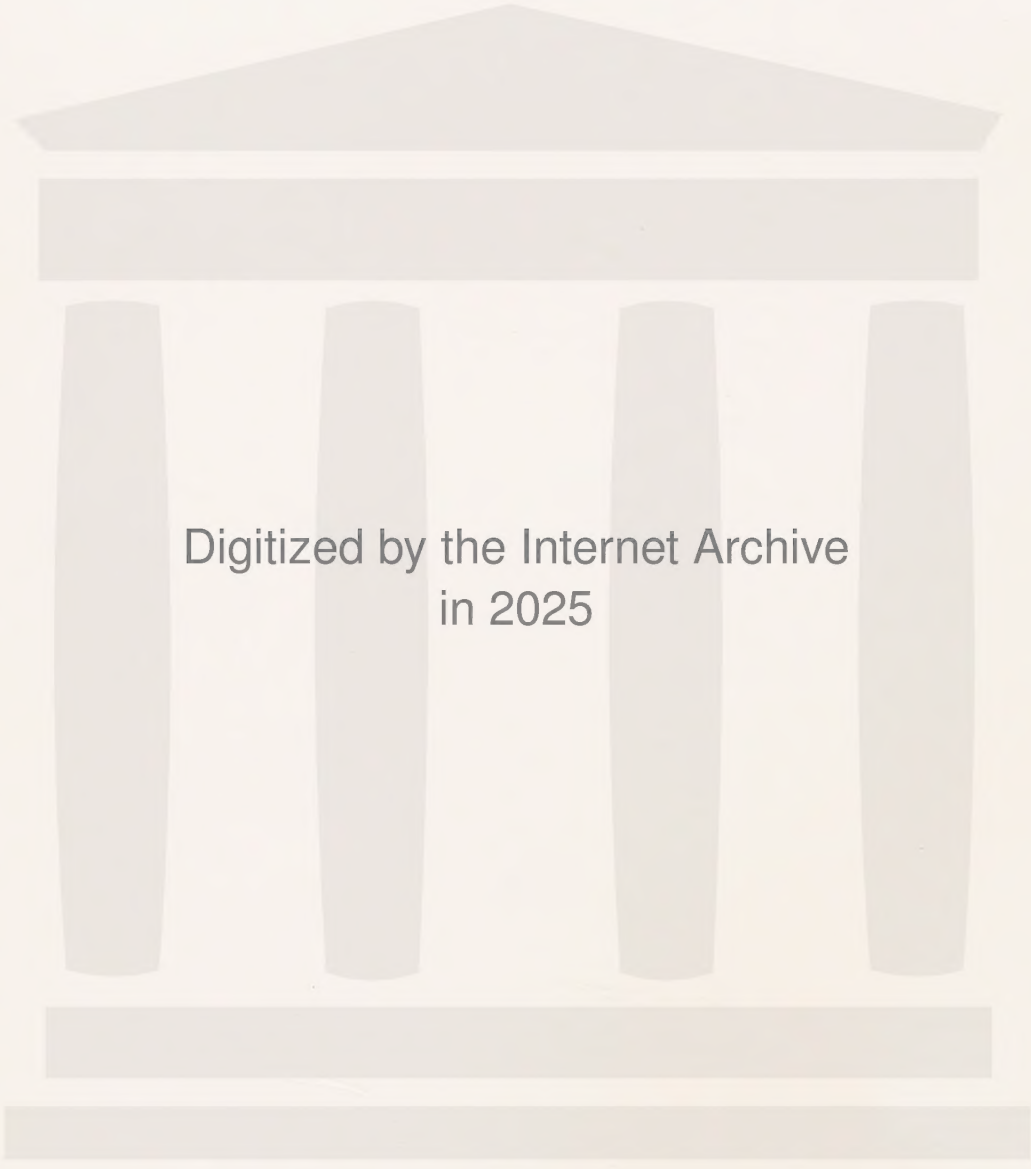
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Fishery Leaflet 329

Washington 25, D. C. September 1948

# FISHING INDUSTRY OF BRAZIL

By Jack E. Conner 1/

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1/ Vice Consul, American Embassy, Rio de Janeiro, Brazil. Report No. 202, June 3, 1948.

## BACKGROUND

Fishing in Brazil is little developed as an industry, and is of relatively small economic importance. There is much subsistence fishing, wherever there is water; but fish is imported into all parts of Brazil, both canned and salted. The Ministry of Agriculture's official data show that the value of fish caught in Brazil in 1942 was Cr$186,000,000. This amounts to less than one half of one per cent of the Brazilian national income for 1942, and to about one tenth of the value of U. S. fisheries products in 1939.

Primitive methods of fishing prevail throughout the country. The tropical coasts abound with fish, but the varieties are so numerous that large schools of a single species are rarely encountered; thus it is difficult if not impossible to employ large-scale methods. In the sub-tropical waters off the southern coasts, roughly from the Federal District to the Uruguayan border, it is possible to use the trawler and purse seine which are found so profitable in the northern oceans. Such an industry would be based on sardines and shrimp.

Efforts to develop the fishing industry during the past ten years have been sporadic and, usually, fruitless. The number of motor-powered fishing boats is small and so is the average horsepower of their engines. Few of them have any refrigerating equipment, and fuel is expensive. Thus the fishermen face a dilemma; if they go out far enough to find good fishing, or if they stay long enough to fill their holds, the catch begins to deteriorate before it can be marketed; if they fish close to shore for short times, the catch is hardly worth the cost of fuel.

Some fishermen in most sections of the country are aware that their operations are uneconomical, but capital for the purchase of new and efficient equipment is lacking. There is also a shortage of trained and experienced fishermen. Several state governments are studying the possibility of providing boats, refrigerating equipment, and storage space to increase the food supply; the effectiveness of these studies is problematic. The federal government has established various agencies designed to encourage fishing, including a factory for processing shark livers at Sao Luiz, Maranhao, several experimental stations, and experimental hatcheries.

A reliable source reports that no fish cannery in Brazil uses proper hygienic measures in processing the fish. This condition did not change during the war, and has not changed since.

Two new fishing vessels of 187 tons displacement were placed in operation on the high seas off Rio Grande, Rio Grande do Sul, in May, 1948. These sister vessels are 25 meters in length, have capacity for 60 tons of fish each, and are driven by engines of 150 horse power. These craft are being used as trawlers. This fleet will be completed when the third boat, now under construction, begins operation. Another firm in Rio Grande is building two ocean-going vessels of 80 tons capacity.

There are only about 300 engine-driven fishing-vessels in all Brazil, of which all but ten or twelve are concentrated in the ports of Santos and Rio de Janeiro.

All federal activities connected with fishing are directed from the Hunting and Fishing Division (Divisao de Caca e Pesca) of the Ministry of Agriculture. The most ambitious undertaking of this division is the system of "colonies", regional organizations whose major purpose is the welfare and education of the fishermen and their families. These colonies are provided with medical assistance and with primary teachers.

There follows a translation in part of an interview with Dr. Ascanio Faria, Director of the Hunting and Fishing Division, published in August, 1942, by the newspaper A Manha, Rio de Janeiro:

"How the Fishing Industry in Brazil was Organized and Developed"

Organization: Since the first days of independence, fishing has entered into the thinking of the Government. As years passed by, they issued laws, regulations, and administrative orders seeking solutions for the economic, social, and political problems connected with that industry, but all the wise legislation produced no practical result. Not even the Hague Convention of 1882, which ceded to Brazilians the exclusive privilege of fishing in our waters, succeeded in nationalizing that activity.

....The fisherman remained abandoned to fate, and the fishing industry, completely unorganized. Only with the Law of January 4, 1912, was a rational plan formed, with the creation in the Ministry of Agriculture of a Fish Inspection Service (Inspetoria de Pesca), whose principal objectives were to study and develop the natural resources of our waters, the creation of fishing colonies and primary and technical schools, and the collection under a single directorate the scientific and technical research activities, besides administrative and inspectional duties. This organization had only an ephemeral existence, and its services fell to the Ministry of Marine.

In 1923 there was organized the Directorate of Fishing and Sanitation of the Coast (intended principally to eliminate the malaria and yellow fever), subordinate to the Directorate of Ports and Coasts (in the Ministry of Marine), which regulated the fishing industry and worked actively for its nationalization. Its efforts still did not meet the real needs of the industry. When in 1933 an Inspection Service for Hunting and Fishing was set up under the Department of Animal Production of the Ministry of Agriculture, the new Service entered into agreement with the Ministry of Marine for the elaboration of fishing regulations, at the same time soliciting the collaboration of the National Museum. This understanding resulted in a shift of jurisdiction over matters concerned with fishing from the Ministry of Marine to that of Agriculture.

The problems of the fishing industry are so varied that it is necessary to attend simultaneously to the improvement of fishing methods and equipment, technical instruction, commercial organization, installation of receiving stations (entrepostos) and markets, development of derivative industries, the encouragement of pisciculture, studies of plankton, and many other subjects, including the welfare and protection of the fishermen, themselves. This fact brought about a surprisingly rapid development of varied services which ultimately culminated in the creation of the Service of Hunting and Fishing (Servico de Caca e Pesca), which later was changed to the Division of Hunting and Fishing (Divisao de Caca e Pesca), subordinate to the National Department of Animal Production (Departamento Nacional de Producao Animal).

Economic Aspects of Fishing: For efficiency, it was necessary to group all services under one head.

It was in 1938, under Decree No. 23,134 of the provisional government, that the Directorate of Fishing and Sanitation of the Coasts was transferred from the Ministry of Marine to the Ministry of Agriculture, with provision for the former to keep jurisdiction over matters concerned with the naval reserve. It may be said that this decree marks the beginning of the economic phase of Brazilian fishing.

In 1938 the first fishing census was undertaken, and it was found that there were 68,819 fishermen registered in the country: 189,017 persons supported by fishing; 46,014 children of school age, of whom 54% were in school; and 31,017 boats propelled by sails or oars, and 266 motor-driven boats. This work permitted the rational reorganization of the colony system.

A parallel renovation of fishing legislation was undertaken, resulting in the approval of the Hunting and Fishing Code (Codigo de Caca e Pesca), later in 1938 divided into two distinct codes.

Fish Commerce and the Role of the "Entrepostos": To develop fishing and to protect the fishermen, it was necessary to set up centers for receipt and distribution of the catch, with adequate installations, to regulate the fishing commerce and industry. These entrepostos have been established in Rio de Janeiro, Aggra dos Reis, Cananeia, Rio Grande, Ponta de Pedras, Serinhaem, and Cabedelo. (Since publication of this interview, such entrepostos have been set up also in Recife, Joao Pessoa, Manaus and Sao Francisco.

Development of Fish-Products Industries: The Ministry of Agriculture, since 1938, has rendered all possible assistance to factories engaged in the manufacture of fish products, a business which has responded with great growth, especially in the southern states.

The creation of the Loan Fund for Fishermen and Fish Manufacturers (Caixa de Credito aos Pescadores e Armadores de Pesca) are accomplishments which have contributed much to the development of a strong fishing industry.

Inland Fishing and the Encouragement of Pisciculture: One of the major objectives of this Division is the rational exploitation of the fish resources in our rivers and lakes. These inland fishing grounds receive the same attention as the ocean fisheries.

Biologic and ecologic studies on various species of fresh-water fish (including Astronotus, Cichla, Prochilodus, Salminus, Leporinus, Odonthestes, and others) give the key to artificial culture of these fish, for stocking rivers and lakes. Already in operation are the stations at Pirassununga, state of Sao Paulo, and at Porto Alegre, where special work is being done to adapt the peixe-rei (Odonthestes) to Brazilian waters. (Since the publication of this interview, four other experimental hatcheries have begun operation. These are located at Rio de Janeiro, Distrito Federal; Lago dos Quadros, Rio Grande do Sul; and the National School of Agriculture, State of Rio de Janeiro. )

Social Assistance to Fishermen: The Polyclinic of the Division of Hunting and Fishing has twelve special mobile hospitals, offering free surgery, odontology, pharmacy and general medical aid to the fishermen in the Federal District and the State of Rio de Janeiro. Similar facilities will ultimately be made available to all the fishing colonies. A good idea of the work of the polyclinic may be obtained by examining its work from June, 1941, when it began operation, through December of the same year; in that period, 12,854 patients availed themselves of the service.

## LOCATION

The principal fishing districts of Brazil, in the order of volume of fish taken, are:

| | |
|---|---|
| Southeastern coast (supplying Rio de Janeiro and Sao Paulo) | 41% |
| Southern coast | 24% |
| Northern coast | 20% |
| Eastern coast | 8% |
| Other | 7% |

The most important ports are Rio de Janeiro in the Federal District, Santos in the state of Sao Paulo, Rio Grande in the state of Rio Grande do Sul, Sao Luis in the state of Maranhao, and Niteroi in the state of Rio de Janeiro. These five ports account for more than half of the catch.

The continental shelf varies in width from 10 miles off Bahia to over 100 miles on the southern coast. It is more than 60 miles wide all the way from Cabo Frio in the state of Rio de Janeiro to the Uruguayan border.

This shelf is the most important fishing ground available, both actually and potentially. It is exploited more extensively off Santos and Rio de Janeiro than anywhere else, and even here the boats rarely go out as far as forty miles. The shelf ends at a depth of about 200 meters. The only other places where oceanic fishing is considerable are at the mouths of the Amazon and the numerous rivers of the state of Maranhao. At least 90% of the fish taken in the state of Rio Grande do Sul comes from the system of lakes along the coast, the largest of which is the Lagoa dos Patos. This system includes at least 7,000 square miles of fresh water, which is often made brackish for long periods when high tides allow the ocean to pass the narrow sand-spits separating the lakes from the sea. Fresh water fishing is most important in the north, especially in the Amazon and its tributaries, where some species are fished commercially in the wet season. From the tabulation above, it can be seen that only about 7% of the total catch comes from rivers and lakes other than the Lagoa dos Patos system.

## EMPLOYMENT

Table I shows the numbers of fishermen registered on December 31, 1946, in the several states and territories. These figures are based on reports of port captains in the respective states.

TABLE I: Fishermen Registered with the Captains of the Ports, December 31, 1946

| State or Territory | Number of Fishermen |
|---|---|
| Amazonas and Acre | 677 |
| Para | 4,401 |
| Maranhao | 6,064 |
| Piaui | 518 |
| Ceara | 3,218 |
| Rio Grande do Norte | 4,008 |
| Paraiba | 951 |
| Pernambuco | 7,587 |
| Alagoas | 698 |
| Sergipe | 2,052 |
| Bahia | 4,445 |
| Rio Sao Francisco | 345 |
| Espirito Santo | 1,809 |
| Distrito Federal | 13,234 |
| Sao Paulo | 3,139 |
| Parana | 1,527 |
| Santa Catarina | 9,637 |
| Rio Grande do Sul | 3,503 |
| Rio Parana | 65 |
| Mato Grosso | 6 |
| Total | 67,884 |

Source: "Directoria da Marinha Mercante"

The total of 67,884 differs only slightly from the figure of 68,819 determined during the first fishing census, taken in 1938. It is not known whether this figure includes all fishermen or only those organized in colonies. In 1938 the 68,819 fishermen had a total of 120,198 dependents, giving a total of 189,017 persons supported by the industry.

The official data on value of fish is based on prices paid to fishermen for their catch. Assuming that the average number of fishermen was 68,000 the average income of the fishermen can be computed from these data:

| Year | Value of catch | Average income |
|---|---|---|
| 1939 | Cr$136,429,200 | Cr$2006 |
| 1940 | 149,168,657 | 2194 |
| 1941 | 162,022,153 | 2383 |
| 1942 | 184,501,123 | 2713 |
| 1943 | 195,805,821 | 2879 |
| 1944 | 233,161,099 | 3429 |
| 1945 | 254,455,400 | 3742 |

Note: The Cruzeiro is officially valued at US$0.5342.

No exact data are available for years later than 1945, but it is known that the general price level has risen sharply, and that, even though the fishermen are now receiving more nominal pay for their catch, their economic condition is little different from what it was in the years studied.

The vast majority of Brazilian fishermen have no set wages or contract of any kind; the few who are employed work on shares or as crew members. No information is available concerning minimum working conditions or limitations on hours of labor.

Information on subsistence fishing is not available.

There is little sport fishing in Brazil, this pastime being confined to small numbers of foreigners and an even smaller number of native Brazilians in the larger cities. The dourado Salminus maxillesus, of the southern rivers, is considered an excellent game fish of superior flavor. Harpoon fishing for sport, with goggles, breathing tubes, rubber foot-fins, and spring-powered guns, may be seen on the resort beaches of Rio de Janeiro.

## FISHING VESSELS

On June 1, 1948, there were 309 engine-powered fishing boats in Brazil. Of these, 182 are registered in Rio de Janeiro and the Federal District; 118 have oil-burning engines, and 64 use gasoline. Boats driven

by outboard motors are not included in this figure. One hundred twenty of the engine-driven boats are registered at Santos. Thus all but seven of the 309 are in these two areas. Of the others, one is in Victoria, Espirito Santo, three are in Belem, Para, one is in Sao Luis, Maranhao, and two are in Rio Grande do Sul. Four additional vessels are being constructed in Rio Grande do Sul. Some of the sailboats used in Rio Grande do Sul have auxiliary gasoline engines.

These engine-driven vessels vary in horsepower from seven to 150. The average horsepower of the vessels registered in Santos and Rio de Janeiro is about 30. None of the vessels, so far as is known, has refrigerating equipment. Many of them fill their holds with ice before leaving port, but the extent of this practice is not known.

Other fishing vessels used in Brazil are powered by sails or oars. Table II shows the numbers of vessels operating and the types which dominate in each state for which the information is available.

TABLE II

| State | No. vessels | Type of vessels |
|---|---|---|
| Para | 600 | sailboats, 5-10 tons |
| Maranhao | 3,400 | sailboats, 1 ton |
| Ceara | 1,000 1/ | balsa raft, sack sails, US$200 |
| Pernambuco | 1,000 1/ | balsa raft, sack sails, US$400 |
| Bahia | 2,700 1/ | dugout canoes, small sailboats |
| Espirito Santo | 2/ | small canoes and sailboats |
| Rio de Janeiro | 182 3/ | trawlers and seiners; also many small boats |
| Sao Paulo | 111 3/ | trawlers, average 10 tons, 11 meters |
| Rio Grande do Sul | 2,000 1/ | sailboats, 1-1.1/2 tons, 180 with auxiliary motors |
| BRAZIL | over 11,000 | mostly small sailboats; number of canoes and outboard motorboats unknown |

1/ Estimated
2/ Not available
3/ Not including canoes, small sailboats, rafts, and outboard motorboats.

In no part of Brazil is the fishing equipment adequate to exploit the possibilities of the fishing grounds or of the potential public demand for fish. Only in Pernambuco and in Santos, it is reported, are the existing vessels adequate to meet the existing demand. The new and projected vessels in Rio Grande do Sul are expected to improve the situation measurably in that state.

## FISHING METHODS EMPLOYED

Along the coasts from Victoria, Espirito Santo, northward, fish weirs constructed of bamboo stakes, sticks, or, rarely, wire netting, are common. They are seen less frequently on the coasts south of Victoria. Species taken in these weirs are weakfish, mullet, carangids, small sharks, and various grunts, snappers, groupers, and croakers.

Also in use on all the coasts and sometimes in wide rivers are long drag nets up to 200 meters in length. Waters as deep as three meters are fished with these nets. Often four fishermen will operate a net, one holding an end on the beach while the others set the net from a canoe, bringing the other end to shore fifty or sixty meters from the starting point. They depend on passersby to help bring the net ashore; a large drag net requires the work of fifteen men for over an hour. Sometimes a second and even a third net is dragged behind the main drag, to catch the fish that jump out. Besides the expected limicoline species such as mullet, weakfish, croaker, runner, and the like, some fairly large amberjacks and shark up to four feet long are brought in.

Other methods of fishing on the coasts are the cast net, the hand net, the hand line, and the trot line. All of these are used mainly in subsistence fishing.

The purse seine and the trawl are the most important methods of offshore fishing. Boulters, hand lines, gill nets, trolling lines, and traps are also used.

The most productive method of fishing is the purse seine. It is used in taking menhaden, sardines, snappers, weakfish, croakers, barracuda, albacore, runners, bumpers, bonito, mackerel, moonfish, and others. The most important fish taken by this or any other means is the sardine, including species of several genera and two families.

The trawl as used in Brazil is not an otter trawl, as it has no paravanes to spread the wings; rather, it is drawn by two boats running a parallel course and maintaining the proper distance. It is used not for bottom fishing but as a substitute for the purse seine, and for taking the same species.

Most bottom fishing is done with deep hand lines and boulters. These are used mostly for the namorado, Pseudopercis numida, tilefish, and large groupers.

Gill nets are used near the shore, suspended in known fish runs, and are one of the major means of taking shark along the northern coasts.

Special cast nets and drag nets are used in shrimp seining along the beaches.

Brazilian Two-Boat Trawl

Drag Net

Methods of fishing, by regions:

Southern coast, including Rio Grande do Sul, Santa Catarina, and Parana:

Commercial fishing is done almost entirely with small trawls. The new ocean-going fleets will use purse seines. Subsistence fishermen use hand lines, trot lines, and small cast nets.

Southeastern coast, including Sao Paulo, Rio de Janeiro, and the Federal District:

Commercial fishermen use purse seines, trawls, gill nets, large drag nets, weirs, boulters, and hand lines.

Non-commercial fishermen use hand lines, weirs, trot lines, small seines, and cast nets.

Eastern coast, from Espirito Santo to Rio Grande do Norte:

Offshore fishing is done with floating nets, boulters, traps, and hand lines. Almost all the fishing craft along the coasts of Alagoas, Sergipe, Pernambuco, Paraiba, and Rio Grande do Norte are sailing rafts, using hand lines only. Sailboats are in common use off Bahia and Espirito Santo.

Inshore fishing is done with cast nets, weirs, gill nets, and hand lines.

Northern coast, from Ceara to Amazonas:

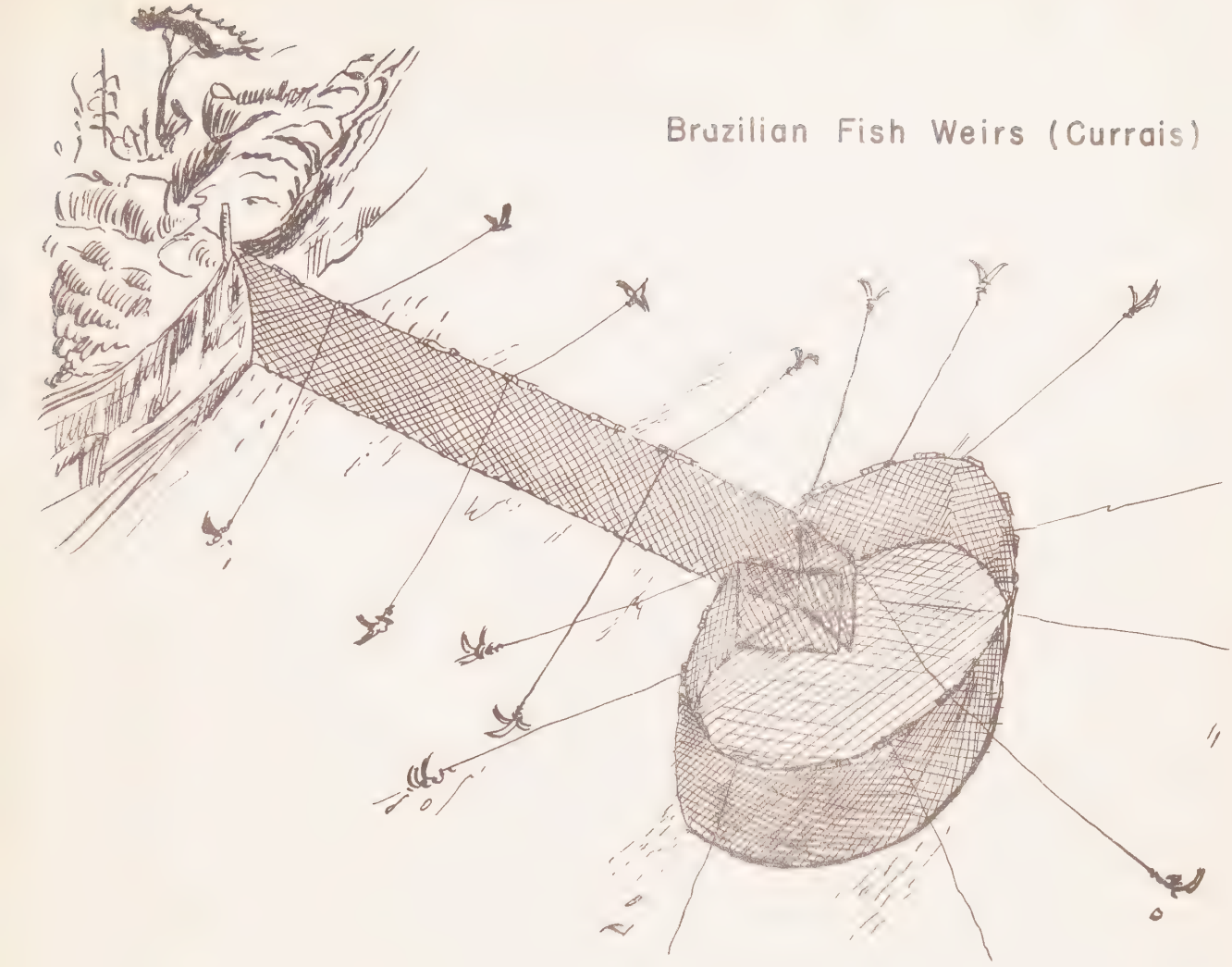
Little offshore fishing is done, the only vessels in use being sailing rafts and a few small sailboats. The bottom is too rocky for the use of trawls, and hand lines predominate.

Inshore fishing is done with barrage nets across the mouths of rivers, trap nets, weirs, gill nets, hand lines, beach seines, and harpoons.

Interior regions:

Almost all fishing is with hand lines and trot lines. Hooks are often made by hand. Where the piranha (Serrasalmo) is found, wire leaders are necessary. The use of poisonous plants is illegal except for Indians; nevertheless, this method is commonly employed in the northern rivers. Plants used for this purpose include Hura crepitans L., Piscidia sp., and Lonchocarpus of various species. Roots or branches of these plants, or sometimes of others which are poisonous to fish, are crushed to free the poison and cast into the stream. Usually the stream has been dammed to concentrate the poison. The dead fish which come to the surface can be used for food if eaten immediately, but they deteriorate rapidly.

# Brazilian Fish Weirs (Currais)



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Brazilian Sailing Raft (Jangada) and Set Lines

Harpooning Pirarucú (Arapaiama gigas) in the Amazon

## SPECIES

According to official statistics from the Ministry of Agriculture, about 25% of the catch is made up of fishes of the group Isospondyli, with the sardinha (of many species) leading and the pirarucu (Arapaima gigas) of the Amazon and other northern rivers second. The major use of the sardine is for canning, while the pirarucu is dried and used as a substitute for cod.

Another 25% is made up of fishes of the group Synentognathi. Of these the most important is the voador, or flying fish, which is a popular staple in the interior of the northeastern states. The most common species are of the genera Exocoetus and Cypsilurus.

The division Ostariophysi, including characins and cichlids as well as catfishes, accounts for 24%. No single species is of outstanding importance.

In descending order of abundance are the groups Acanthopterygil, Persesoces, and Scombreformes. All the other major groups of fishes are represented, and practically no species are considered completely inedible. Official statistics include, in addition to the true fishes, sharks and rays, lungfishes, hagfishes, crustaceans, molluscs, and at least one mammalian species, the peixe-boi (Manatus). Historically there has been some whaling off the coast from Natal to Salvador, and it is reported that as many as 45 whales were taken in a single year during the twenties and thirties. Information concerning the weight or value of whales taken is not available.

The following lists include only species which are reported to have entered commercial channels since 1940. Except in a few cases, it has not been possible to determine definitely the specific names of the general listed. It will be noted that many of the native names are applied to fishes of more than one genus, and that some individual species are known by more than one native name. Native names of Indian origin are marked, on Table IV, with asterisks (*).

### TABLE III

| Scientific Names | Native Names |
|---|---|
| Isospendyli: | |
| Anchoa (all species) | manjuba |
| Arapaima gigas | pirarucu |
| Brevoortia tyrannus | savelha |
| Chalcinus | sardinha |
| Clupea | sardinha |
| Elops saurus | chira; ubarana |
| Lysengraulis | sardinha |

| Scientific Names | Native Names |
|---|---|
| Megalops | camorupim |
| Opisthonema oglinum | sardinha lage |
| Harengula | sardinha cascuda |
| Sardinella | sardinha verdadeira |
| Stolephorus | anchova |
| Tarpon atlanticus | camorupim |
| **Apodes** | |
| Gymnothorax | moreia |
| Gymnotus | - |
| **Ostariophysi: catfishes, characins, and cichlids** | |
| **catfishes** | |
| Arius | bagre |
| Bagre | bagre |
| Brachyplatystoma | piraiba, piramutaba, filhote |
| Corydoras | serra |
| Doras | cuia-cuiu |
| Erythrinus | jeju |
| Felichthys | bagre |
| Genidens | bagre |
| Loricardia | cascudo |
| Paulicea | jahu |
| Pimelodella | mandim |
| Plecostemus | cascudo |
| Pseudoplatystoma | sorubim, surubim |
| Pseudopimelodus | pacamao, pocomon |
| Rhamdia | jundia |
| Tachysurus | arituassu |
| **Characins, Cichlids, and other Ostariophysi** | |
| Acestrorhamphus | cachorra, tambicu |
| Astrenetus | apaiari |
| Brycon | matrinxa |
| Callichthys | camboata, tamboata |
| Carpus | carpa |
| Cichla ocellaris | tucunare |
| Cichla multifasciata | " |
| Cichla temensis | " |
| Crenicichla | cuia-cuiu, jacunda |
| Geophagus | acara |
| Hoplias malabaricus | traira |
| Hydrogenus | acara |

| Scientific Names | Native Names |
|---|---|
| **Characins, Cichlids, and other Ostariophysi (Cont'd)** | |
| Leporinus | aracu, piau, piaba, lambari |
| Megalobrycon | piabanha |
| Prochilodus | curimata |
| Serrasalme | caribe, piranha |
| **Synentognaths** | |
| Belone | agulhao |
| Exocoetus | voador |
| Cypsilurus | voador |
| Hemirhamphus | agulha |
| Hyporhamphus | tambicu |
| Tylosurus | agulha |
| **Grunts, groupers, snappers, sea-bass, etc.** | |
| Anisotremus | salema |
| Archosargus | canhanha, sambuio, zambulho |
| Bathystoma | sapuruna |
| Centropemus | robalo robalete |
| Conodon nobilis | coro, roncador |
| Diapterus | carapeba, caratinga |
| Diplectrum radiale | michole |
| Dipledus | marimba |
| Epinephelus | badejo, cherna, garoupa, mero, |
| Eucinostomus | carapicu (serigado |
| Garrupa | garoupa |
| Haemulon | biquara, cambura, corcoroco, |
| Holocentrus | jaguarica (pirambu |
| Kyphosus sectatrix | choupa, pirajica |
| Lobetes surinamensis | prejereba, perigeraba |
| Lutianus | vermelho |
| Mycteroperca | badejo branco, badejo ferro, (badejete |
| Neomaenis | bauna, cioba, caranha, carapi- |
| Orthopristis | corcoroco (tanga |
| Oxylabrax | camorim |
| Oxyurus | guaiuba, rabo aberto |
| Pagrus | pargo |
| Priacanthus | olho de cao, pirapitanga |
| Promicrops | mero |
| Rachycentron canadus | bejupira, pirabiju |
| Rhomboplites | areoco, cioba |
| Rypticos sapenaceus | badejo sabao |

| Scientific Names | Native Names |
|---|---|
| **Croakers, drums, and weakfish** | |
| Archoscion petranus | goete, bocamole, pescada |
| Bairdiella | cangoa |
| Cynoscion | pescadinha, pescada, perna da |
| Cynoscion virescens | cambucu (meca |
| Eriscion | pescadinha, pescada |
| Isopisthus parvipinnis | pescadinha do alto mar |
| Larimus breviceps | oveva |
| Macrodon ancylodon | pescadinha do alto mar |
| Micropogon | corvina, cururuca, goete |
| Nebris microps | pescadinha banana, pescadinha |
| Pogonias cromis | miraguaia, pirauna (rosa |
| Paralonchurus brasiliensis | maria luisa, pescadinha |
| Pematomus saltatrix | enxova |
| Plagioscion | pescadinha |
| Umbrina ceroides | corvina riscada, castanha |
| **Heterosomata** | |
| Achirus | linguado |
| Paralichthys | linguado |
| Symphurus | lingua da mulata |
| **Percesoces** | |
| Mugil | curiman, parati, sauna, tainha |
| Mullus | salmonete |
| Odonthestes | peixe-rei |
| Polydactylus | parati barbude |
| Sphyraena | bicuda |
| **Scombriformes** | |
| Acanthecybim | cavala-aipi |
| Argeniosus | mandube |
| Caranx | aracaroba, aracimbora, xareu, |
| Chastodipterus faber | espada (chumberga |
| Chloroscombrus chrysurus | palombeta |
| Coryphaena | dourado |
| Decapterus | xixarro, chicharro |
| Germo alalunga | albacora |
| Gumnosarda | bonito |
| Istiophorus | agulhao de vela |
| Malacanthus plumieri | pira |
| Oligoplites | guaivira, guavina, salteira |
| Parathunnus | albacora |
| Parona | pampo do alto mar |

| Scientific Names | Native Names |
|---|---|
| Scombriformes (Cont'd) | |
| Peprilus paru | redondo, gordinho |
| Sarda sarda | bonito, serra, sarda |
| Scomber colias | cavalinha |
| Scomberomorus | cavala, sororoca |
| Selene vomer | galo |
| Seriola | arabaiana, olhete, olho de boi |
| Trachinotus | pampo, galhudo |
| Trachurops | guarajuba |
| Trichiurus | espada |
| Vomer setapinnis | galo |
| Xiphias gladius | agulhao |
| Plectegnaths | |
| Acanthurus | barbeiro |
| Balistes | cangulo, peroa |
| Chastodon | enxada |
| Diodon | baiacu |
| Menocanthus hispidus | peixe porce |
| Pomacanthus | paru |
| Pseudopercis numida | namorado |
| Salminus | dourado |
| Lagocephalus | baiacu-ara |
| Scaridae (all) | bodiao |
| Labridae (all) | bodiao |
| Tilefish | |
| Branchiostegus | batata |
| Caulolatilus | batata |
| Lopholatilus | batata |
| Lungfish | |
| Lepidosiren | caramuru, mussum |
| Sharks and rays | |
| Alopias | cachorro, cacao rapesa |
| Bathoides | arraia |
| Carcharias | cacao |
| Carcharoden | anaquim |
| Carcharinus | cacao enxofre, ponta preta, |
| Eulamia | cacao (marracho |
| Ginglymostoma | gata, cacao lixa |

| Scientific Names | Native Names |
|---|---|
| Sharks and rays (Cont'd) | |
| Mustela | cacao |
| Narcine | arraia, viola |
| Nebrius | cacao |
| Pristis | serra |
| Raja | arraia |
| Rhinobates | arraia |
| Sphyrna | martelo |
| Squalus | cacao bagre |
| Trygon | arraia |
| Hagfishes | |
| Petromyzen | lampreia |
| Molluscs | |
| Clams (all) | mariscos |
| Oysters (all) | ostras |
| Octopus (all) | polve |
| Loligo | lula |
| Loligunculus | lula |
| Crustaceans | |
| Senex | lagosta |
| Palinurus | lagosta |
| Lobsters (all) | lagosta |
| Crawfish (all) | lagosta |
| Penaeus | camarae |
| Xyphepenaeus | camarae |
| Crage | camarae |
| Shrimps and prawns (all) | camarae |
| Mangrove crab | goiamun |
| Uca | uca, gruca |
| Gallinectes | siri |
| Crabs (all) | carangueijo |
| Mammals | |
| Manatus | Peixe-boi |

TABLE IV

| Native Names | Scientific Names |
|---|---|
| * acara | Geophagus, Hydrogenus |
| agulha | Hemirhamphus |
| agulhao | Belone |
| agulhao de vela | Istiopherus |
| albacora | Germo |
| amoreia | (eel) |
| anaquim | Carcharodon |
| anchova | Stolephorus |
| * apaiari | Astronotus |
| * arabaiana | Seriola |
| * aracaroba | (Carangidae) |
| * aracu | Leporinus |
| * aeroce | Rhomboplites |
| * arituassu | Tachysurus |
| arraia | (rays, including Trygon, Bathoides, Thinobates, Raja, Narcine, etc.) |
| * bacu | Doras |
| badejo | Epinephelus, Mycteroperca, Typti- |
| bagre (any catfish) | cus, etc. |
| * baiacu | Diodon |
| barbeiro | Balistes |
| barbudo | Polynemus, Rhamdia, Polymixia |
| batata | (Branchiostegidae) |
| * bauna | Neomaenis |
| * bejupira | Rachycentron |
| * betara | Menticirrhus |
| bicuda | Sphyraena |
| * biquara | Haemulon |
| bocamole | Archoscion |
| bodiao | (Scaridae and Labridae) |
| bonito | Sarda, Gymnosarda |
| cabeca dura | Stellifer |
| cacao | (any shark) |
| cachorra | Acestrorhamphus |
| cachorro | Cynoden |
| * cambeva | Sphyrna |
| * camboata | Callichthys |
| * cambura | Haemulon |
| * camorim | Centropomus, Labrax, Oxylabrax |
| * camorupim | Megalops |
| * canapu | (Serranidae) |
| * cangoa | Bairdiella |
| * cangulo | Balistes |
| * cangurupeba | Oxylabrax |
| * caramuru | Lepidosiren |
| * canhanha | Archosargus |
| * caranha | Neomaenis |
| * carapeba | Diapterus |
| * carapicu | Eucinostomus |

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| Native Names | Scientific Names |
|---|---|
| * carapitanga | Neomaenis |
| * caratinga | Diapterus |
| * carauna | Teuthis |
| * caribe | Serrasalmo |
| carpa | Carpus |
| cascude | Plecostomus |
| cavala | Scomberomorus, Acanthocybium |
| cherne | Epinephelus |
| chicharro | Decapterus, Trachurus, Selar |
| choupa | Kyphesus, Cantharus |
| chumberga | (Carangidae) |
| * cioba | Neomaenis, Rhomboplites |
| * corcoroce jurumirim | Orthopristis |
| * corcoroce mulata | Haemulon |
| * coro | Conodon nobilis |
| * corumbata | Prechilodus |
| * corvina | Micropogon, Sciaenia, Umbrina |
| * cuia-cuiu | Crenicichla, Doras |
| * curima | Mugil |
| * curimata | Prochiledus |
| * cururuca | Micropogon, Sciaenia, Umbrina |
| * curuvina | Micropogon |
| dentao | (Sparidae) |
| deurado | Coryphaena, Salminus |
| enxova | Pematomus |
| espada | Trichiurus, Chaetodipterus, Xiphias |
| faqueco | Carangops |
| filhote | Brachyplatystoma |
| gale | Selene, Vomer |
| * garapeba | Diapterus |
| garoupa | Epinephelus, Acanthistius, Alphestes, |
| gato | (any catfish) etc. |
| * goete | Archoscion |
| * guaiuba | Oxyurus |
| * guarajuba | Trachurops |
| * guaricema | (Carangidae) |
| * guavina | Oligoplites |
| * guriaman | Mugil |
| * Jaguarica | Holocentrus |
| * Jahu (jau) | Paulicea lutkeni |
| * jeju | Erythrinus |
| * jucunda | Crenicichla |
| * kandiru | Vandalis |
| * lamerao | Mustelus |
| * lambari | Leporinus |
| linguado | (any flatfish) |
| lingua de mulata | Symphurus |
| * mandim | Pimelodella |
| * manjuba | Anchoa |
| maria luisa | Paralonchurus |

| | Native Names | Scientific Names |
|---|---|---|
| | marimba | Dipledus |
| * | matrinxa | Characinus |
| | merete | Epinephelus, Promicrops |
| | mere | Epinemphelus, Premicrops |
| * | miroro | (Muraenidae) |
| * | miraguaia | Pogonias |
| | moreia | Gymnothorax |
| * | mussum | Lepidosiren |
| | namorado | Pseudopercis |
| | olhete | Seriola |
| | olho de boi | Seriola |
| | olho de cae | Priacanthus |
| * | oveva | Larimus |
| | palembeta | Chloroscombrus |
| | pampo | Trachinotus |
| | papaterra | Menticirrhus |
| | parati | Mugil, Polydactylus |
| | pargo | Pagrus |
| * | paru | Pomacanthus, Chastodipterus, Angelichthys |
| | peixe-rei | Odonthestes |
| | penna | Calamus |
| * | perigereva | Lebetes |
| * | peroa | Balistes |
| | pescada | (any large weakfish) |
| | pescadinha | (any small weakfish) |
| * | petitinga | (Engraulidae) |
| * | piaba | Tetragenopterus, Astyanax |
| * | piabanha | Megalobrycon |
| | piau | Leporinus |
| * | pira | Malacanthus |
| * | Piraiba | Brachyplatystoma |
| * | pirajica | Kyphosus |
| * | pirambu | Haemulon |
| * | piramutaba | Brachyplatystema |
| * | piranha | Serrasalmo |
| * | pirapiranga | Brycon, Priacanthus |
| * | piraputanga | Brycon, Priacanthus |
| * | pirarara | ( a catfish) |
| * | pirarucu | Arapaima |
| * | Pira-siririca | Menticirrhus |
| * | pirauna | Bodianus |
| * | pacamao | Pseudopimelodus |
| * | pratibu | Mugil |
| * | prejereba | Lobotes |
| | rabo aberto | Oxyurus |
| | redondo | Peprilus |
| | remeiro | Seriola |
| | robalete | Labrax,Oxylabrax, Centropomus |
| | robalo | Labrax, Oxylabrax, Centropemus |
| | roncador | Conodon |
| | salema | Anisotremus |
| | salmonete | Mullus |

| | Native Names | Scientific Names |
|---|---|---|
| * | sambuio | Archosargus |
| * | sapuruna | Bathystoma |
| * | sarapo | Carapus |
| | sarda | Sarda, Gymnesarda |
| | sardinha verdadeira | Sardinella aurita |
| | sardinha prata | Lysengraulis |
| | sardinha bandeira | Opisthonema |
| | sardinha | (Engraulidas, Clupeidas) |
| * | sauna | Mugil |
| | savelha | Brevoortia |
| | serigado | Epinephelus |
| | serra | Pristis, Sarda |
| * | sioba | Neomaenis, Rhomboplites |
| | salteira | Oligoplites |
| * | sororoca | Scomberomorus |
| * | surubim | Platystema |
| * | tainha | Mugil |
| * | tambicu | (Hemirhamphidas) Hyporhamphus |
| * | tamboata | Callichthys |
| * | traira | Hoplias |
| * | tucunare | Cichla |
| * | ubarana | Elops |
| | vermelho | Lutianus |
| | voador | Exocoetus (any flying fish) |
| | xarelete | Caranx (small specimens) |
| | xareu | Caranx |
| | xixarro | Decapterus, Trachurus, Selar |
| * | zambulhe | Archosargus |

## FISH TAKEN 1937 TO DATE

No reliable data on the amount of fish taken in Brazil are available, for any year. The Ministry of Agriculture has published tables giving Brazilian production of fish in the years from 1939 to 1945, inclusive; but these tables are admittedly incomplete, and it is not stated whether they include fish taken by non-colonized fishermen or not. There do not exist any data to show exactly or even approximately what proportion of the commercial fishing population is colonized, or what proportion of the catch actually passes through the "entrepostes de pesca" set up to control and study the fishing industry.

Table No. V, entitled "Brazil: Fish Taken, by States and Years, 1939 to 1945," based on data furnished by the Federal Ministry of Agriculture, gives the most nearly accurate information available.

The most important single species is undoubtedly the sardine Sardinella aurita. This species, together with other small clupeids, is estimated to account for nearly 20% of all fish caught in Brazil. They are used mainly for canning, but many are eaten fresh as well.

Following in importance are the pirarucu, Arapaima gigas, and the voador, which includes several species of flying fish. The pirarucu is the most important river fish in the country; it is dried and shipped all over Brazil as a substitute for dried cod. Dried flying fish is an important staple in the northeastern interior.

Other important fishes, whose relative importance can not be ascertained, are weakfish, croakers, mackerel, catfish, and mullet. Common names are misleading for several reasons. Since such fish as weakfish, namorado, and dourado enjoy the reputation of having fine flavor, their vulgar names are not infrequently applied to fish of other species; fish are often miscalled through carelessness or ignorance; there are fewer vulgar fish-names than there are species of fish, so that the same name may signify as many as a dozen distinct species. Furthermore, a given species of fish is known by different names in different places; Pogenias cromis is called miraguaia from Rio de Janeiro southward; from Vitoria north it is called pirauna. Conversely, the same common name is often applied to totally different species; in the north of Brazil, espada is the cutlass-fish, Trichiurus, while in the south, espada is the spadefish, Chaetodipterus.

The data given in Table No. V refer to entire weight. The inedible portions of the fish are not utilized, but are dumped. There exist no considerable factories of fish meal, fertilizer, or other by-products of fish.

## PRODUCTION AND METHODS OF PROCESSING

The only commercial freezing units now in operation in Brazil are located in Rio Grande do Sul. Fresh fillets of fish are marketed locally in that state, and frozen fillets are shipped to the populous areas surrounding Sao Paulo and Rio de Janeiro. The volume of this coastwise trade is unknown. Species filleted are Tachysurus barbus, Paralichthys brasiliensis, Micropogon undulatus, various weakfish, and others.

TABLE V - BRAZIL: FISH TAKEN BY STATES AND YEARS

- Metric Tons -

| State | 1939 | 1940 | 1941 | 1942 | 1943 | 1944 | 1945 | Average |
|---|---|---|---|---|---|---|---|---|
| Acre 1/ | 130 | 164 | 194 | 222 | 316 | 331 | 296 | 236 |
| Alagoas | 849 | 1,212 | 1,398 | 1,383 | 1,251 | 1,655 | 1,303 | 1,293 2/ |
| Amapa 1/ | - | - | - | - | - | 170 | 328 | (71) |
| Amazonas | 2,331 | 3,678 | 4,646 | 3,982 | 3,673 | 4,442 | 3,168 | 3,703 |
| Baia | 1,484 | 1,936 | 1,932 | 2,427 | 3,657 | 3,759 | 4,128 | 2,760 |
| Ceara | 2,340 | 2,435 | 2,239 | 2,272 | 3,269 | 3,301 | 3,729 | 2,798 |
| Espirito Santo | 1,754 | 2,253 | 2,124 | 1,941 | 2,200 | 2,402 | 2,844 | 2,217 |
| Goias | 60 | 98 | 125 | 97 | 58 | 45 | 71 | 79 2/ |
| Guapore 1/ | - | - | - | - | - | 72 | 76 | (81) |
| Maranhae | 12,358 | 13,694 | 15,848 | 14,904 | 14,606 | 13,917 | 14,787 | 14,302 |
| Mato Grosso | 236 | 238 | 540 | 496 | 336 | 651 | 402 | 414 |
| Minas Gerais | 330 | 481 | 494 | 447 | 523 | 796 | 874 | 563 |
| Para | 5,699 | 5,750 | 4,986 | 5,870 | 5,241 | 5,942 | 6,204 | 5,670 |
| Paraiba | 2,022 | 2,250 | 1,804 | 1,716 | 772 | 714 | 741 | 1,431 |
| Parana | 569 | 550 | 590 | 500 | 604 | 592 | 619 | 575 |
| Pernambuco | 793 | 780 | 875 | 673 | 877 | 775 | 839 | 802 |
| Piaui | 122 | 179 | 130 | 177 | 232 | 289 | 244 | 196 2/ |
| Rio Branco 1/ | - | - | - | - | - | 216 | 257 | (67) |
| Rio de Janeiro | 11,003 | 11,178 | 10,381 | 13,059 | 14,207 | 15,004 | 26,071 | 14,415 |
| Rio Grande do Norte | 1,060 | 2,151 | 2,096 | 1,418 | 2,204 | 2,863 | 4,202 | 2,284 |
| Rio Grande do Sul | 22,684 | 23,060 | 25,902 | 28,149 | 30,541 | 18,079 | 15,510 | 23,418 |
| Santa Catarina | 1,923 | 2,787 | 4,400 | 5,758 | 5,153 | 3,963 | 5,966 | 4,279 |
| Sao Paulo | 16,782 | 16,918 | 15,963 | 16,757 | 15,029 | 11,965 | 13,291 | 15,243 |
| Sergipe | 219 | 319 | 431 | 401 | 372 | 412 | 881 | 433 |
| Distrito Federal | 18,530 | 18,488 | 19,185 | 17,196 | 17,958 | 22,469 | 15,713 | 18,506 |
| TOTAL: | 103,278 | 110,599 | 116,283 | 119,845 | 123,079 | 114,824 | 122,544 | 115,779 |

1/ Territory
2/ Territory established in 1943; no statistics compiled earlier than 1944. Number in "Average" column weighted for seven-year table.

Source: Production Statistical Service - Ministry of Agriculture

Thirteen fish canneries operate in the state of Rio de Janeiro, eleven in Rio Grande do Sul, three in the Federal District, one in the state of Sao Paulo, and one in Pernambuce. Information on the production of these establishments is available only for the year 1942.

The factories located in Rio Grande do Sul, Rio de Janeiro, and the Federal District received 10,305 metric tons of whole fish. Rio Grande do Sul factories took more than 7,000 metric tons of which 6,500 went to Rio Grande; the state of Rio de Janeiro took 2,500 tons, Sao Goncale being the most important point with 2,000 tons; and the remainder of about 500 tons was processed in the Federal District.

Sardines made up 3,500 tons of the total, followed by catfish, 2700 tons, Micropogon, 1000 tons, and Mugil, 1000 tons.

There is no commercial production of pickled fish in Brazil.

Dry salted fish rivals canned sardines in volume and value. Since no recent or accurate data are available concerning either of the commodities in question, it is not possible to make a direct comparison.

Dried fish is prepared in all the coastal regions of Brazil, as well as along the rivers in the north. Sometimes the fish is smoked as well as dried, and sometimes it is prepared without salt; but the vast majority is simply dry salted fish.

The species most commonly used for drying are Arapaima gigas, catfish of various species, groupers and snappers, sharks and rays, and weakfish. Large amounts of dried shrimp are shipped from Rio Grande do Sul to all other parts of the country. These are reported to be hard, salty, and unpalatable.

Smoked fish is of little commercial importance at present. For some years the Hunting and Fishing Division of the Ministry of Agriculture has been conducting experiments with various processes of smoking fish, and has published a bulletin entitled "A Defumacao do Pescado," (The Smoking of Fish, 1941) by Elzamann Magalhaes, Technical Assistant. This bulletin, after discussing several European and North American processes, concludes that, while methods used at present in Brazil are not so efficient or so economical as the methods described, yet these are too expensive in first cost to be practical for most Brazilian fishermen.

The bulletin gives a list of species of fish which the Hunting and Fishing Division considers to be especially suitable for smoking. It is not intended to imply that all of the species named are abundant enough in Brazil to make the smoking of them a profitable venture. All the salt-water species named in the list, which follows, have been smoked successfully at both high and low temperatures:

| Scientific Names | Native Names |
|---|---|
| **Fresh-Water fish** | |
| Osteoglessum bicirrhesum | aruana |
| Prochiledus brevis | curimata |
| Paulicea lutkeni | jahu |
| Hypephthalmus darvala | mapara |
| Characinus amazonicus | matrinxa |
| Myletes durimentris | pacu |
| Myletes edulis | pacu |
| Arapaima gigas | pirarucu |
| Pseudeplatystoma sp. | sorubim |
| Myletes bidens | tambaqui |
| Cichla Coellaris | tucunare |
| **Salt-water fish** | |
| Urophycis sp. | abrotea, brotea |
| Gormo alalunga | albacora |
| Sarda sarda | bonito |
| Gymnosarda sp. | bonito |
| Sphyraena sp. | bicuda |
| Squalidas (fam.) | cacao bagre |
| Scomberomorus sp. | cavala |
| Scomber colias | cavalinha, mussundum |
| Conger sp. | congro |
| Micropogon sp. | corvina |
| Coryphaena hippurus | dourado |
| Anchoa sp. | manjuba |
| Merlucius bilinearis | merluza, pascada mole |
| Pinguspes brasilianus | michola |
| Pogonias cromis | miraguaia, pirauna |
| Muraena sp. | moreia |
| Pseudopercis numida | namorado |
| Seriola carolinensis | olhete, arabaiana branca |
| Seriola lalandi | olho de boi, arabaiana pintada |
| Cynoscion sp. | pescada, pescadinha |
| Sardinella, Opisthonema | sardinha |
| Caranx crysos | xerelete |
| Caranx hippos | xareu |
| Trachurops, trachurus | xixarro |
| Mugilidas (fam.) | tainha, parati |

## PRODUCTION OF BY-PRODUCTS

Production of fish by-products is on a small scale, even in comparison with the small volume of the total catch.

a. Fish oil

There are numerous factories, mostly small, which extract fish oil, fish liver oil, and shark liver oil. Most of the production is unfit for use as food or drugs, and is used instead as lubricant and in tanning.

The factories producing fish oils are located in Rio Grande do Sul, Sao Paulo, Bahia, and the Federal District. No statistics are available to show volume of production. It is estimated that Sao Paulo's production is about 120 metric tons per year, and Bahia's, about 5 metric tons.

b. Fish meal

There is no fish meal industry in Brazil.

c. Other by-products.

None

## CONSUMPTION

Brazilian consumption of fish and fish products in a normal year amounts to not more than 140,000 metric tons, of which some 18,000 consists of imports; 94% of the prewar imports were dried codfish, the rest being canned sardines and small amounts of other preserved fish products. It is not possible to determine how much of the Brazilian production of fish is sold fresh and how much is finally consumed as salt fish, canned fish, and other preserved fish products. Production figures cited are whole fish, of which a large proportion is waste; therefore the total tabulated supply of edible fish products is considerably less than 100,000 metric tons. To this must be added an indeterminate amount of fish caught for personal consumption or for sale but not reported to the compilers of statistics. Including all sources of fish, the per capita daily consumption of fish can not exceed 15 kilograms per year - about 40 grams per day per person.

## INTERNATIONAL TRADE CONTROL AND PATTERN 1937 TO 1947

Importation and exportation of fish during 1945, 1946 and 1947 are shown in tables Nos. VI, VII, VIII, IX, and X.

Monthly figures on imports and exports before 1945 are not available. The yearly totals for the years 1937 to 1947, inclusive, are shown in table No. XI.

Before the federal government's order of April 6, 1948, prohibiting the exportation of foodstuffs from Brazil, there was no restriction on the exportation of fish and fish products from this country. Such exports are presently subject to the granting of prior export licenses.

Codfish (including also several other kinds of dried fish imported under the general name of bacalhau) is on the list of products considered "essential" to Brazil's economy, and as such is accorded first priority in the granting of foreign exchange privileges. Other fish products, such as canned sardines and luxury items like anchovy paste, caviar, rollmops, and smoked oysters, are not considered essential, and it is increasingly difficult for importers of these and similar items to obtain dollar exchange.

Although the statistical tables above mentioned show that almost all imports of fish enter through Rio de Janeiro and Santos, these centers do not consume such a large proportion. It is known that much of the volume is reshipped to other parts of Brazil; the extent and distribution of this trade is not known.

Brazilian Federal Tariff duties on Fish and Fish Roes are shown in table No. XII.

TABLE No. VI - BRAZIL: Exports of FISH Canned, by Country of Destination, 1945, 1946, 1947

- 1945 -

| Country | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Kgs | Kgs | Kgs | Kgs | Kgs | Kgs | Kgs | Kgs | Kgs | Kgs | Kgs | Kgs | Kgs |
| Poland | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 306,466 | 0 | 0 | 306,466 |
| Greece | 0 | 0 | 0 | 0 | 0 | 0 | 141,600 | 0 | 0 | 0 | 0 | 0 | 141,600 |
| Argentina | 0 | 0 | 59,499 | 0 | 60,750 | 3,900 | 0 | 0 | 4,000 | 9,000 | 0 | 0 | 137,149 |
| Bolivia | 571 | 7,800 | 0 | 0 | 3,900 | 58 | 68 | 18 | 10,920 | 9 | 27 | 30 | 23,401 |
| Colombia | 0 | 0 | 0 | 0 | 0 | 3,150 | 900 | 0 | 0 | 0 | 0 | 12,200 | 16,250 |
| U. S. A. | 0 | 6,580 | 0 | 7,420 | 0 | 0 | 0 | 1,350 | 0 | 0 | 0 | 0 | 15,350 |
| Paraguay | 3,602 | 0 | 0 | 0 | 0 | 0 | 0 | 3,830 | 0 | 0 | 0 | 3,640 | 11,072 |
| Uruguay | 1,025 | 0 | 0 | 0 | 9,570 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10,595 |
| French Guiana | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7,500 | 7,500 |
| Netherlands Antilles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,740 | 0 | 0 | 0 | 5,740 |
| Peru | 0 | 1,500 | 0 | 0 | 10 | 1,170 | 0 | 3 | 0 | 660 | 564 | 0 | 3,907 |
| Martinique | 0 | 0 | 0 | 0 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 300 |
| TOTAL | 5,198 | 15,880 | 59,499 | 7,420 | 74,530 | 8,278 | 142,568 | 5,201 | 20,660 | 316,135 | 591 | 23,370 | 679,331 |

Source: Economic and Financial Statistical Service-
Ministry of Finance

Table VI (Cont'd.) - Brazil: Exports of Fish Canned by Country of Destination

| Country | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1946 | Kgs. | Kgs. | Kgs. | Kgs. | Kgs. | Kgs. | Kgs. | Kgs. | Kgs. | Kgs. | Kgs. | Kgs. | Kgs. |
| United States | 873,820 | 0 | 9,480 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 883,316 |
| Uruguay | 0 | 0 | 2,200 | 2,900 | 0 | 0 | 100,000 | 7,000 | 0 | 0 | 0 | 0 | 112,100 |
| Belgium | 0 | 48,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48,000 |
| Java | 0 | 31,434 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31,434 |
| Colombia | 0 | 2,400 | 0 | 0 | 0 | 2,000 | 7,700 | 0 | 5,000 | 0 | 0 | 0 | 17,100 |
| French Guiana | 0 | 0 | 0 | 0 | 8,000 | 0 | 0 | 0 | 0 | 7,200 | 0 | 0 | 15,200 |
| Argentina | 0 | 3,200 | 1,920 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,120 |
| Bolivia | 160 | 112 | 31 | 29 | 79 | 355 | 20 | 77 | 0 | 0 | 0 | 120 | 983 |
| Netherlands Antilles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 750 | 0 | 0 | 0 | 0 | 750 |
| Peru | 0 | 0 | 300 | 0 | 0 | 156 | 0 | 0 | 0 | 0 | 0 | 0 | 456 |
| Total | 873,980 | 85,146 | 13,931 | 2,929 | 8,079 | 2,511 | 107,736 | 7,827 | 5,000 | 7,200 | 0 | 120 | 1,114,459 |
| 1947 | | | | | | | | | | | | | |
| Argentina | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10,900 | 0 | 10,900 |
| Bolivia | 75 | 0 | 32 | 0 | 103 | 0 | 80 | 0 | 0 | 0 | 0 | 0 | 290 |
| Total | 75 | 0 | 32 | 0 | 103 | 0 | 80 | 0 | 0 | 0 | 10,900 | 0 | 11,190 |

Note: In 1945, 99.3% of all fish exports consisted of canned sardines. The remainder consisted of crustaceans and molluscs to the Netherlands Antilles and of unspecified preserved fish to Peru. In 1946, 96.3% of all fish exports consisted of canned sardines. The remainder consisted of crustaceans and molluscs to the Netherlands Antilles and of unspecified fish to Java, French Guiana, and Colombia. The 1947 shipments to Bolivia were of canned sardines; those to Argentina were of fresh frozen fish.

TABLE No. VII - BRAZIL: Exports of FISH, 1945, 1946 and 1947 - by Ports of Entry

- Kilograms -

| Port | JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1945 | | | | | | | | | | | | | |
| Rio de Janeiro | 4,627 | 6,580 | 59,499 | 7,420 | 70,320 | 3,900 | 0 | 5,180 | 0 | 210,200 | 0 | 15,840 | 383,566 |
| Santos | 0 | 0 | 1 | 0 | 0 | 3,150 | 142,500 | 0 | 9,740 | 105,266 | 0 | 0 | 260,657 |
| Guajara-Mirim | 0 | 7,800 | 0 | 0 | 3,900 | 0 | 0 | 0 | 10,837 | 0 | 0 | 0 | 22,537 |
| Belem | 0 | 0 | 0 | 0 | 300 | 1,170 | 0 | 0 | 0 | 660 | 564 | 7,500 | 10,194 |
| Manaus | 0 | 1,500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,500 |
| Corumba | 571 | 0 | 0 | 0 | 0 | 58 | 68 | 18 | 84 | 9 | 27 | 30 | 865 |
| Porto Alegre | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 13 |
| TOTAL | 5,198 | 15,880 | 59,500 | 7,420 | 74,530 | 8,278 | 142,568 | 5,201 | 20,661 | 316,135 | 591 | 23,370 | 679,332 |
| 1946 | | | | | | | | | | | | | |
| Rio de Janeiro | 618,820 | 53,600 | 13,600 | 2,900 | 0 | 2,000 | 107,716 | 7,000 | 5,000 | 0 | 0 | 0 | 810,636 |
| Santos | 255,000 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 255,120 |
| Belem | 0 | 0 | 0 | 0 | 8,000 | 0 | 0 | 0 | 0 | 7,200 | 0 | 120 | 15,320 |
| Corumba | 160 | 112 | 31 | 29 | 79 | 355 | 0 | 77 | 0 | 0 | 0 | 0 | 843 |
| Manaus | 0 | 0 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 300 |
| Brasileia (Acre) | 0 | 0 | 0 | 0 | 0 | 156 | 0 | 0 | 0 | 0 | 0 | 0 | 156 |
| TOTAL | 873,980 | 53,712 | 13,931 | 2,929 | 8,079 | 2,511 | 107,736 | 7,077 | 5,000 | 7,200 | 0 | 120 | 1,082,375 |
| 1947 | | | | | | | | | | | | | |
| Rio de Janeiro | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10,900 | 10,900 |
| Corumba | 75 | 0 | 0 | 32 | 0 | 103 | 0 | 80 | 0 | 0 | 0 | 0 | 290 |
| TOTAL | 75 | 0 | 0 | 32 | 0 | 103 | 0 | 80 | 0 | 0 | 0 | 10,900 | 11,190 |



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Source: Economic and Financial Statistical Service-

Ministry of Finance

Table No. VIII - Brazil: Imports of Bacalhau Cod[1/] by Country of Origin - Jan.-Dec. 1945, 1946 and 1947

| Country | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1945 | | | | | | | | | | | | | |
| Newfoundland | 0 | 0 | 806,606 | 0 | 72,500 | 0 | 0 | 0 | 58,000 | 0 | 0 | 0 | 937,106 |
| United States | 0 | 0 | 22,680 | 99,791 | 0 | 27,172 | 27,201 | 0 | 82,300 | 0 | 0 | 26,581 | 285,725 |
| Canada | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23,311 | 0 | 0 | 0 | 0 | 23,311 |
| Chile | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9,240 | 0 | 0 | 9,240 |
| Argentina | 0 | 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,200 | 2,280 |
| Total | 0 | 80 | 829,286 | 99,791 | 72,500 | 27,172 | 27,201 | 23,311 | 140,300 | 9,240 | 0 | 28,781 | 1,257,662 |
| 1946 | | | | | | | | | | | | | |
| Norway | 0 | 219,588 | 185,890 | 170,024 | 110,954 | 0 | 400,350 | 381,461 | 320,492 | 580,250 | 397,762 | 397,412 | 3,164,183 |
| Newfoundland | 0 | 0 | 701,133 | 791,816 | 4,350 | 0 | 0 | 26,100 | 0 | 633,621 | 0 | 522,464 | 2,679,484 |
| Sweden | 200,000 | 200,000 | 0 | 0 | 0 | 0 | 0 | 0 | 205,800 | 12,500 | 0 | 102,000 | 720,300 |
| Denmark | 0 | 52,500 | 0 | 5,000 | 112,800 | 0 | 25,000 | 0 | 109,350 | 44,350 | 0 | 46,550 | 395,550 |
| United Kingdom | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 135,216 | 35,967 | 82,479 | 253,662 |
| Canada | 0 | 9,580 | 112,946 | 17,418 | 3,787 | 0 | 16,606 | 0 | 0 | 12,192 | 0 | 7,666 | 180,195 |
| United States | 0 | 14,515 | 13,608 | 0 | 18,144 | 0 | 0 | 7,494 | 27,677 | 0 | 0 | 39,443 | 120,881 |
| Chile | 0 | 0 | 0 | 10,500 | 0 | 0 | 0 | 0 | 85,500 | 0 | 9,000 | 9,750 | 114,750 |
| Total | 200,000 | 496,183 | 1,013,577 | 994,758 | 250,035 | 0 | 441,956 | 415,055 | 748,819 | 1,418,129 | 442,729 | 1,207,764 | 7,629,005 |
| 1947 | | | | | | | | | | | | | |
| Denmark | 56,250 | 22,850 | 0 | 55,000 | 57,850 | 6,850 | 25,000 | 0 | 0 | 0 | 0 | 15,000 | 238,800 |
| United States | 73,770 | 4,508 | 123,341 | 236,712 | 207,694 | 97,641 | 102,239 | 147,472 | 100,693 | 135,581 | 180,813 | 195,831 | 1,606,295 |
| United Kingdom | 108,670 | 20,648 | 0 | 56,260 | 0 | 0 | 65,018 | 94,134 | 136,010 | 0 | 194,119 | 95,730 | 770,589 |
| Norway | 558,764 | 783,126 | 311,228 | 6,550 | 756,854 | 0 | 1,756,635 | 64,264 | 196,356 | 2,145,792 | 234,835 | 725,551 | 7,539,955 |
| Canada | 45,362 | 79,192 | 0 | 32,853 | 92,932 | 203,010 | 22,679 | 33,296 | 0 | 0 | 34,657 | 0 | 563,981 |
| Sweden | 96,710 | 1,000 | 0 | 0 | 0 | 0 | 10,000 | 0 | 0 | 0 | 0 | 200,000 | 307,710 |
| Terra Nova | 0 | 594,670 | 190,820 | 97,614 | 0 | 0 | 0 | 42,195 | 188,268 | 317,840 | 890,509 | 814,958 | 3,136,874 |
| Chile | 0 | 0 | 15,000 | 1,500 | 34,500 | 0 | 19,500 | 9,000 | 94,830 | 0 | 0 | 0 | 174,330 |
| Netherlands | 0 | 0 | 150,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150,000 |
| Madeira | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30,421 | 0 | 0 | 0 | 30,421 |
| Belgium | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8,700 | 8,700 |
| Portugal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2,900 | 2,900 |
| Total | 939,526 | 1,505,994 | 790,389 | 506,489 | 1,149,830 | 307,501 | 2,001,071 | 390,361 | 746,578 | 2,599,213 | 1,534,933 | 2,058,670 | 14,530,555 |

1/ Including halibut, pollock, hake, and others.

Source: Economic and Financial Statistical Service, Ministry of Finance.

Table No. IX - Brazil: Imports of Fish Other Than Cod[1/], 1945, 1946, and 1947, by Country of Origin

| Country | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1945 | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. |
| Argentina | 15,538 | 9,008 | 4,000 | 0 | 17,375 | 43,261 | 2,370 | 9,246 | 7,406 | 11,472 | 0 | 28,760 | 148,436 |
| Portugal | 18,141 | 0 | 15,749 | 9,863 | 1,600 | 5,736 | 33,098 | 39,403 | 10,875 | 32,150 | 32,136 | 52,430 | 251,181 |
| Chile | 20,210 | 0 | 34,160 | 0 | 0 | 22,140 | 13,200 | 0 | 0 | 1,860 | 0 | 0 | 91,570 |
| Spain | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 151 | 0 | 0 | 15,498 | 15,649 |
| United States | 0 | 0 | 773 | 204 | 0 | 2 | 923 | 4,536 | 817 | 0 | 0 | 3,538 | 10,793 |
| Canada | 0 | 0 | 0 | 8 | 1,228 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,236 |
| Total | 53,889 | 9,008 | 54,682 | 10,075 | 20,203 | 71,139 | 49,591 | 53,185 | 19,249 | 45,482 | 32,136 | 1 [illegible] | 518,865 |
| 1946 | | | | | | | | | | | | | |
| Portugal | 896 | 32 | 54,452 | 8,270 | 7,787 | 0 | 46,218 | 58,225 | 122,186 | 409,080 | 454,756 | 581,146 | 1,743,048 |
| Norway | 0 | 3,865 | 0 | 5,898 | 8,637 | 0 | 15,775 | 3,500 | 34,913 | 148,449 | 17,500 | 22,549 | 261,086 |
| Argentina | 13,536 | 0 | 1,255 | 4,680 | 31,178 | 0 | 0 | 22,325 | 23,616 | 48,043 | 26,272 | 11,200 | 182,105 |
| Chile | 1,350 | 15,662 | 0 | 33,000 | 13,500 | 0 | 12,000 | 2,370 | 10,500 | 0 | 30,115 | 33,760 | 152,257 |
| Spain | 0 | 15,038 | 29,276 | 0 | 0 | 0 | 15,183 | 0 | 20,920 | 10,725 | 14,550 | 4,050 | 109,742 |
| Netherlands | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 18,263 | 71,271 | 7,540 | 8,857 | 105,931 |
| United States | 2,268 | 2,722 | 0 | 46 | 6,635 | 0 | 17,464 | 9,570 | 1,124 | 30 | 902 | 17,918 | 58,679 |
| Canada | 0 | 0 | 0 | 0 | 46 | 0 | 0 | 0 | 0 | 2,049 | 15,306 | 0 | 17,401 |
| Madeira Is. | 0 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 14,674 | 1,236 | 0 | 16,410 |
| United Kingdom | 0 | 0 | 0 | 11,340 | 0 | 0 | 0 | 0 | 4,350 | 0 | 0 | 0 | 15,690 |
| Sweden | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,500 | 2,346 | 3,250 | 927 | 8,023 |
| Peru | 0 | 0 | 0 | 1,008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,008 |
| Denmark | 0 | 80 | 0 | 0 | 250 | 0 | 0 | 0 | 0 | 0 | 0 | 310 | 640 |
| Italy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 502 | 502 |
| All others[2/] | 2,268 | 2,722 | 0 | 12,394 | 6,931 | 0 | 17,964 | 9,570 | 6,974 | 16,753 | 20,694 | 19,657 | 116,383 |
| Total | 18,050 | 37,399 | 84,983 | 64,242 | 68,033 | 0 | 107,140 | 95,990 | 237,372 | 706,667 | 571,427 | 681,219 | 2,672,522 |

1/ Includes canned sardines (40%), dry salt fish unspecified (22%), canned fish unspecified (17%), salt fish in brine (13%), and crustaceans and molluscs (8%).

2/ "All others" in 1946 includes U.S.A., Canada, Madeira Islands, the United Kingdom, Sweden, Peru, Denmark, and Italy, in that order

Source: Economic and Financial Statistical Service, Ministry of Finance.

Table No. IX (Cont'd) - Brazil: Imports of Fish Other Than Cod[1/], 1945, 1946, and 1947, by Country of Origin

| Country | January | February | March | April | May | June | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1947 | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. |
| Portugal | 91,231 | 55,498 | 42,619 | 16,165 | 53,416 | 14,328 | 27,036 | 26,379 | 13,621 | 7,461 | 51,402 | 79,566 | 478,722 |
| Chile | 34,320 | 90,580 | 15,000 | 12,113 | 0 | 80,500 | 44,940 | 54,000 | 0 | 40,470 | 0 | 6,000 | 377,923 |
| Norway | 34,379 | 10,615 | 3,600 | 4,500 | 0 | 3,375 | 25,187 | 220 | 0 | 17,845 | 0 | 0 | 99,721 |
| United States | 2,697 | 44 | 4,505 | 20,530 | 5,399 | 10,393 | 18,342 | 1,822 | 2,274 | 95 | 14,873 | 8,179 | 89,153 |
| Netherlands | 10,788 | 0 | 4,343 | 2,166 | 1,500 | 3,953 | 203 | 0 | 34,406 | 15,540 | 0 | 4,045 | 76,944 |
| Canada | 14,289 | 0 | 10,900 | 11,001 | 13,404 | 19,048 | 0 | 7,403 | 0 | 454 | 0 | 0 | 76,499 |
| Sweden | 1,617 | 7,098 | 0 | 0 | 1,469 | 9,364 | 1,772 | 551 | 58 | 2,688 | 0 | 7,062 | 31,679 |
| Spain | 0 | 27,468 | 0 | 3,000 | 0 | 0 | 1,020 | 0 | 0 | 0 | 0 | 0 | 31,488 |
| United Kingdom | 0 | 6,361 | 57 | 55 | 0 | 0 | 4,417 | 0 | 6,076 | 2,193 | 1,246 | 9,220 | 29,625 |
| Argentina | 4,000 | 0 | 4,640 | 0 | 0 | 0 | 0 | 7,918 | 0 | 4,136 | 5,092 | 54 | 25,840 |
| All others[2/] | 8,204 | 325 | 7,911 | 2,400 | 858 | 554 | 2,717 | 293 | 189 | 2,568 | 11,872 | 652 | 38,543 |
| Total | 201,525 | 197,989 | 93,575 | 71,930 | 76,046 | 141,515 | 125,634 | 98,586 | 56,624 | 93,450 | 84,485 | 114,778 | 1,356,137 |

1/ Includes canned sardines (40%), dry salt fish unspecified (22%), canned fish unspecified (17%), salt fish in brine (13%) and crustaceans and molluscs (8%).

2/ "All others" in 1947 includes Italy, Greece, Denmark, Morocco, France, Cuba, and Switzerland, in that order.

Source: Economic and Financial Statistical Service, Ministry of Finance.

Table No. X - Brazil: Imports of Fish, 1945, 1946, and 1947 by Ports of Entry

| Port | Cod | All fish |
|---|---|---|
| 1945 | Kg. | Kg. |
| Rio de Janeiro | 808,457 | 926,778 |
| Santos | 318,705 | 713,916 |
| Recife | 72,500 | 76,361 |
| Salvador | 58,000 | 72,517 |
| Belem | 0 | 900 |
| Manaus | 0 | 477 |
| Total | 1,257,662 | 1,790,949 |
| 1946 | | |
| Rio de Janeiro | 3,856,796 | 5,088,971 |
| Santos | 1,898,548 | 3,128,814 |
| Recife | 878,642 | 939,181 |
| Salvador | 818,119 | 844,781 |
| All others 1/ | 176,900 | 306,406 |
| Total | 7,629,005 | 10,308,153 |
| 1947 | | |
| Rio de Janeiro | 6,265,778 | 6,865,868 |
| Santos | 4,506,181 | 5,153,756 |
| Recife | 1,400,687 | 1,421,928 |
| Salvador | 1,365,618 | 1,370,593 |
| Maceió | 409,253 | 409,403 |
| Cabedelo | 316,519 | 316,519 |
| All others 2/ | 266,519 | 316,849 |
| Total | 14,530,555 | 15,854,916 |

1/ Includes Cabedelo, Belem, Maceio, Manaus, Porto Alegre, Pelotas, Rio Grande, Paranagua, Fortaleza, Floiranopolis, and Sao Luiz.

2/ Includes Porto Alegre, Belem, Joao Pessoa, Rio Grande, Manaus, Fortaleza, Pelotas, Sao Luiz, Paranagua, Natal, Florianopolis, and Ilheus.

Source: Economic and Financial Statistical Service, Ministry of Finance.

Table No. XI - Brazil: Foreign Trade in Fish Products
(1937 to 1947)

| Year | Imports | Exports |
|---|---|---|
| | Kgs. | Kgs. |
| 1937 | 22,408,201 | 3,660 |
| 1938 | 16,432,234 | 8,089 |
| 1939 | 17,025,000 | 11,000 |
| 1940 | 16,507,357 | 32,000 |
| 1941 | 5,672,230 | 17,324 |
| 1942 | 2,017,896 | 82,934 |
| 1943 | 197,525 | 572,603 |
| 1944 | 1,515,618 | 159,929 |
| 1945 | 1,790,949 | 679,332 |
| 1946 | 10,308,153 | 1,114,459 |
| 1947 | 15,854,916 | 11,190 |

Source: Economic and Financial Statistical Service, Ministry of Finance.

Table No. XII - Brazilian Federal Tariff Duties on Fish and Fish Roes

| Product | Cr. $ |
|---|---|
| Roes, fresh by refrigeration or other process, in brine, salted, or smoked | 2.00 per kg. net |
| Roes, preserved by any other process | 12.80 per kg. net |
| Fish, fresh by refrigeration or other process | 0.90 per kg. gross |
| Cod and pollock, dried and salted, with bones | 550.00 per ton net |
| Cod and pollock, dried and salted, boned | 0.90 per kg. net |
| Salted fish, other, and pickled fish | 1.40 per kg. net |
| Preserved by any other process: | |
| Salmon | 9.60 per kg. net |
| Sardines, sprats, brisling and other small fish, and herring | 4.00 per kg. net |
| All others | 7.60 per kg. net |

Source: Tarifa das Alfandegas do Brasil (Brazilian Customs Tariff), Ministry of Finance.

Complete price lists are not available. Table No. XIII shows prices established in 1943 by the Central Price Commission of the Federal Ministry of Labor, Industry, and Commerce. Prices to fishermen are minima; wholesale and retail prices are maxima. Current prices are approximately double the levels shown in the table, but the relative prices for the various species have not altered significantly.

Table No. XIII - Prices

| Species | To Fishermen | Wholesale | Retail |
|---|---|---|---|
| Flatfish | Cr$6.50 | Cr$8.31 | Cr$10.60 |
| Badejete[1] | 5.50 | 7.03 | 9.00 |
| Cynoscion virescens | 5.00 | 6.39 | 8.10 |
| Badejo[2] | 4.70 | 6.01 | 7.70 |
| Cynoscion acoupa | 4.70 | 6.01 | 7.70 |
| Centropomus | 4.50 | 5.75 | 7.40 |
| Pesoadinha[3] | 4.50 | 5.75 | 7.40 |
| Epinepherus Niveatus | 4.20 | 5.37 | 6.80 |
| Mullus | 4.00 | 5.11 | 6.50 |
| Diplectrum | 4.00 | 5.11 | 6.50 |
| Scomberomorus (cavalla and regalis) | 4.00 | 5.11 | 6.50 |
| Garoupa[4] | 3.90 | 4.98 | 6.30 |
| Pseudopercis | 3.60 | 4.60 | 5.90 |
| Pseudomulloides | 3.50 | 4.47 | 5.70 |
| Scomberomorus (maculatus) | 3.20 | 4.09 | 5.20 |
| Lutianus campechinus | 3.20 | 4.09 | 5.20 |
| Lutianus sp. | 3.10 | 3.96 | 5.00 |
| Lobotes | 3.00 | 3.83 | 4.90 |
| Seriola | 3.00 | 3.83 | 4.90 |
| Promicrops | 3.00 | 3.83 | 4.90 |
| Tilefish[5] | 3.00 | 3.83 | 4.90 |
| Conger | 3.00 | 3.83 | 4.90 |
| Mugil[6] | 2.60 | 3.32 | 4.20 |
| Trachinotus | 2.20 | 2.81 | 3.60 |
| Caranx | 1.30 | 1.66 | 2.10 |
| Sardinella | 0.40 | 0.51 | 0.70 |
| Large shrimp | 9.00 | 11.50 | 14.70 |
| Small shrimp | 4.20 | 5.37 | 6.80 |
| Squid | 6.00 | 7.67 | 9.80 |
| Clams | 0.30 | 0.38 | 0.50 |
| Oysters | 1.00 | 1.28 | 1.60 |
| Octopus | 7.00 | 8.95 | 11.40 |
| Crab (Callinectes) | 1.00 | 1.28 | 1.60 |

1/ Young specimens of the genus Mycteroperoa.
2/ Species of the genera Myteroperca, Rypticus and Epinephelus adscensionis.
3/ Species of the genera Cynoscion, Macrodon, Paralonchurus, Nebris, and Isopisthus.
4/ Species of the genera Acanthistius, Caphalopholis, Epinephelus, and Alphestas.
5/ Species of the genera Branchiostegus, Lopholatilus, and Caulolatilus.
6/ Any fish of the family Mugilidae, except those species of small size. Some members of this family reach the length of a meter.

Source: Comissao Central de Precos (Central Price Commission, Ministry of Labor, Industry of Commerce.)

## FISHERY REGULATIONS, POLICIES, AND AGREEMENTS

The National government's regulations governing the fishing industry are contained in the Fishing Code (Codigo de Pesca), Decree-Law No. 794, October 19, 1938. Other regulations concerning the fishing industry are issued from time to time in the form of administrative orders from the Central Price Commission of the Ministry of Labor, Industry, and Commerce, and from the Hunting and Fishing Division of the Ministry of Agriculture.

No bilateral treaties, conventions, or other agreements affecting commercial fisheries and whaling are known.

The Embassy does not know of the existence of any fish export quotas. Allocation of markets and price fixing are under the control of federal agencies.

## INTERNAL TRADE PATTERN

In the eight cities where fish receiving stations (entrepostos de pesca) are in operation, marketing of fish is controlled by these entities. In other places, marketing is not formally organized. Some areas depend entirely on street hawkers for their fish supply; effective refrigerating equipment is not available over most of the country, and the catch must be sold soon after it is taken.

Except for the developments noted in the section on "background", no improvements in technology, organization, or financing are in sight.

## FISHERY RESEARCH

Biological and ecological studies under the direction of the Hunting and Fishing Division of the Ministry of Agriculture are being carried out at six experimental stations, located at the Division's offices in Rio de Janeiro; the National Botanical Garden in Rio de Janeiro; the National School of Agronomy at Kilometer 47 on the Rio de Janeiro-Sao Paulo highway; at Pirassununga, Sao Paulo; at Porto Alegre, Rio Grande do Sul; and at Lagoa dos Quadros, Rio Grande do Sul.

Fish culture and stocking of lakes and streams are being encouraged and fostered by the Division. Species which have been found suitable for culture in the central and southeastern regions of the country are: Salminus maxillosus (dourado), Prochilodus hertii, Leporinus vittatus, Leporinus piapara, Brycon lundii, and Pimelodus elarias. Specimens of Arapiama gigas have been brought from the north and placed in streams in the states of Sao Paulo and Minas Gerais, but all of these disappeared and were presumed to have been unable to survive the relatively low temperatures. Fishes of two other genera from the north, Astonotus and Cichla, have been introduced in the same area, and good results are being obtained with them. Attempts have been made to adapt the "king fish" of Argentina, Odonthestes, in the lakes of Rio Grande do Sul and Sao Paulo. These fish are now being hatched by the millions, it is said, in Lagoa dos Quadros, Rio Grande do Sul, and the initial plantations in Sao Paulo, made in 1946, now can show individual fishes weighing more than one pound. More than 500,000 fingerlings of all species were distributed during 1945, 1946, and 1947.

For many years it has been customary in the northeastern states to make use of the acudes, or natural depressions, which occur near the coast from Sergipe to Ceara. These depressions are located so that high tides in the spring fill them, and historically fish culture in them has consisted merely of letting them fill up and then preventing the water from draining out again. The size of the lakes thus created ranges up to as much as five acres. Many proprietors of acudes plant mangroves and other vegetation to give shade and to increase the growth of algae. These semi-artificial lakes are fished mainly at Easter, both as sport and for food.

There has been, since 1933, increasing interest in controlling the population of these lakes, and since that time fishes of desirable species have been planted in many of the lakes. Genera commonly implanted include Prochilodus, Pimelodus, Cichla, Astronotus, and Plagioscion.

## OUTLOOK SUMMARY

Production of fish has been increasing steadily ever since the first surveys were made in 1938. The speed of this increase can not be expected to increase as long as fishing methods remain in the primitive state they are in now. Officials of the Division of Hunting and Fishing state that Brazil has not yet touched its fishing resources, whether at sea or inland, and that even the extent of those resources is not yet known.

Brazil's import requirements of fish remain at about 18,000 tons a year, as outlined in the Embassy's report No. 91 of February 7, 1945; the item most needed, as indicated by its inclusion in the list of "essential" commodities, is dried cod.